Supplemental Material

Table S1. Model parameters used in experiment 1. Physical model parameters are from published literature on tidal datums, sea-level rise (NOAA); suspended sediments (Staver et al. 2020) , and self-packing densities (Morris et al. 2016) while biological parameters such as the optimum and vertical range of growth and biomass are from on-site survey data; root:shoot ratio and turnover from (Blum 1993; Crosby et al. 2017; Gallagher et al. 1984; Morris et al. 2013; O'Connell et al. 2021) ; and decay rate (Blum and Christian 2004; Godshalk and Wetzel 1978; Hemminga et al. 1988) ; while the refractory fraction is from Klason lignin analyses of live *Spartina* roots and rhizomes by the University of Wisconsin Soil and Forage Laboratory.

	Value		units
Physical Inputs			
Sea Level Forecast	57		cm per century
Sea Level at Start	6.5		cm (NAVD)
Starting SLR	0.57		cm/yr
Mean Tidal Amplitude	16.7		cm
Marsh Elevation @ t0	18.5		cm (MSL)
Susp. Mineral Sed. Conc.	20		mg/l
Suspended Org. Conc.	0		mg/l
Initial Accretion Rate	4.0		mm/yr
Flood Frequency	704		floods yr^{-1}
Minimum Mineral Input	2		mg cm^{-2} yr^{-1}
Model Coefficients			
Max Capture Eff	2.80		unitless
Refrac. Fraction (k_r)	0.1		g/g
Organic self-packing density k_1	0.085		dry g cm^{-3}
Mineral self-packing density k_2	1.99		dry g cm^{-3}
Biological Inputs			
Low marsh species	Young	Mature	
Lower Growth Limits	0	0	cm rel MSL
Upper Growth Limits	53	53	cm rel MSL
Optimum Elevation	25	25	cm rel MSL
Maximum Root Depth	25	25	cm rel surf
Peak Aboveground Biomass	300	2200	g/m2
Belowground Bio to Shoot Ratio	2.0	1.5	g/g
Below Ground Turnover Rate	1.0	0.5	1/year

Time to Maturity		15	years
OM decay rate	0.5	0.5	g g^{-1} y^{-1}
High marsh species	Young	Mature	
Lower Growth Limits	25	25	cm rel MSL
Upper Growth Limits	120	120	cm rel MSL
Optimum Elevation	38	38	cm rel MSL
Maximum Root Depth	25	25	cm rel surf
Peak Aboveground Biomass	300	2200	g/m2
Belowground Bio to Shoot Ratio	2.0	1.5	g/g
Below Ground Turnover Rate	1.0	0.5	1/year
Time to Maturity		25	years
OM decay rate	0.5	0.5	g g^{-1} y^{-1}
Refractory fraction (lignin)	0.1	0.1	g g^{-1}

Table S2. Mean elevation and standing live biomass on random plots harvested in 2021 from different cells.

Cell	Species	N	Mean Elevation ± 1 SD (cm NAVD)	Mean Standing Live Biomass ± 1 SD (g/m^2)
1A	*S. alterniflora*	7	31.8 ± 3.8	1277.4 ± 252.2
	S. patens	6	50.7 ± 7.6	1419.3 ± 434.6
1B	*S. alt*	4	33.3 ± 7.8	1170.5 ± 590.6
	S. pat	2	39.4 ± 3.7	2335.5 ± 1795.3
1C	*S. alt*	3	31.9 ± 2.4	1184.7 ± 190.9
	S. pat	3	53.9 ± 7.5	1917.7 ± 988.6
3A	*Pluchea*	2	37.0 ± 1.4	1475.5 ±120.9
	S. alt	3	26.5 ± 3.0	1208.0 ±481.1
	S. pat	1	48.8	1660.0
3C	*D. spicata*	1	37.2	557.0
	S. alt	3	26.6 ± 4.0	1294.7 ± 330.4
	S. pat	2	37.0 ± 1.9	1756.5 ±1683.6
3D	*Salicornia*	1	35.1	1181.0
	S. alt	4	20.8 ± 3.8	530.5 ± 302.6
	S. pat	5	40.1 ± 3.4	959.4 ± 341.0
4D	*D. spicata*	1	31.7	708.0
	S. alt	3	21.6 ± 4.2	641.0 ± 173.7
	S. pat	2	30.5 ± 6.8	724.0 ±186.7
5AB	*S. alt*	9	33.3 ± 8.4	1361.7 ±567.9
	S. pat	5	50.4 ± 7.9	1408.6 ±738.8

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